

CLAIMS

1. A device for estimating an amount of intake air of an internal combustion engine, wherein an amount of intake air passing through the throttle valve is
5 calculated by using an upstream side intake air pressure upstream of the throttle valve and a downstream side intake air pressure downstream of the throttle valve, and an amount of intake air supplied into the cylinder is estimated on the basis of the amount of intake air
10 passing through the throttle valve, characterized in that the upstream side intake air pressure used at the time when the amount of intake air passing through the throttle valve is calculated is detected or calculated to take account of a pressure loss, produced by at least an
15 air-cleaner, from the atmospheric pressure.

2. A device for estimating an amount of intake air of an internal combustion engine according to claim 1, characterized in that the upstream side intake air pressure used at the time when the amount of intake air passing through the throttle valve at this time is calculated is calculated by subtracting the pressure loss produced by the air-cleaner from the atmospheric pressure, the pressure loss is calculated by using an amount of intake air detected by the air-flow meter or
20 the amount of intake air passing through the throttle valve calculated at the last time, as an amount of intake air passing through the air-cleaner.
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3. A device for estimating an amount of intake air of an internal combustion engine according to claim 2, characterized in that the upstream side intake air pressure at this time is calculated by calculating the pressure loss by using of the amount of intake air passing through the throttle valve calculated at the last time, the amount of intake air passing through the
30 throttle valve at this time is calculated by using of the calculated upstream side intake air pressure at this time and the downstream side intake air pressure at this time,
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and the calculated amount of intake air passing through the throttle valve at this time is corrected by a difference between an assumed amount of intake air passing through the throttle valve at the last time
5 calculated by using the upstream side intake air pressure at this time and the downstream side intake air pressure at the last time, and the amount of intake air passing through the throttle valve at the last time calculated by using of the upstream side intake air pressure at the
10 last time and the downstream side intake air pressure at the last time.

4. A device for estimating an amount of intake air of an internal combustion engine according to claim 3, characterized in that when the assumed amount of intake air passing through the throttle valve at the last time is calculated, the downstream side intake air pressure at the last time is recalculated on the basis of the assumed amount of intake air passing through the throttle valve at the last time.
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20 5. A device for estimating an amount of intake air of an internal combustion engine according to any one of claims 1-4, characterized in that the amount of intake air passing through the throttle valve is calculated on the basis of a ratio the downstream side intake air pressure to the upstream side intake air pressure, and an open area or an opening degree of the throttle valve.
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30 6. A device for estimating an amount of intake air of an internal combustion engine according to claim 5, characterized in that the amount of intake air passing through the throttle valve is calculated by multiplying a first function including the open area or the opening degree of the throttle valve as an only variable, by a second function including said ratio as a variable, by a first correction term for correcting said first function on the basis of a current intake air temperature upstream of the throttle valve and by a second correction term for correcting said first function on the basis of the
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current upstream side intake air pressure.